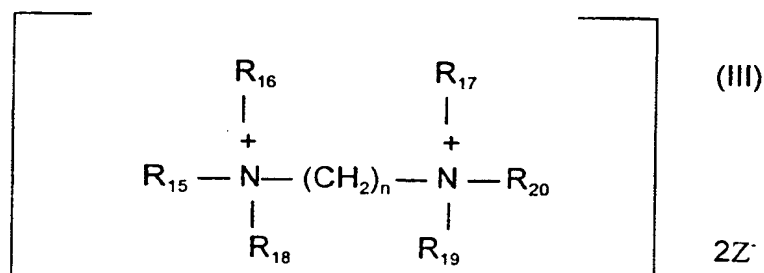
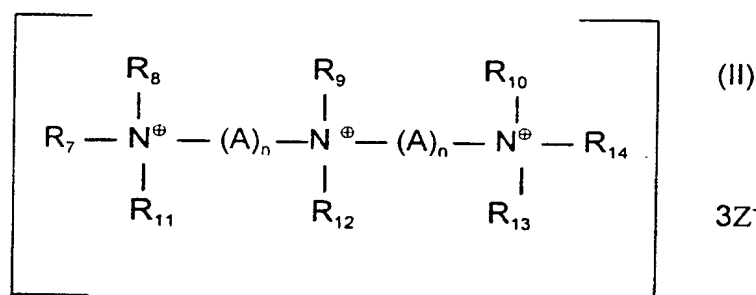
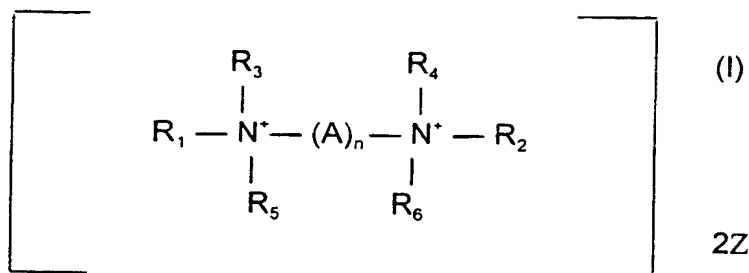
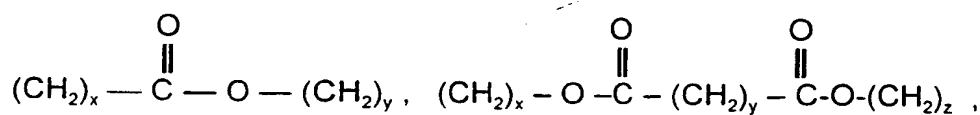


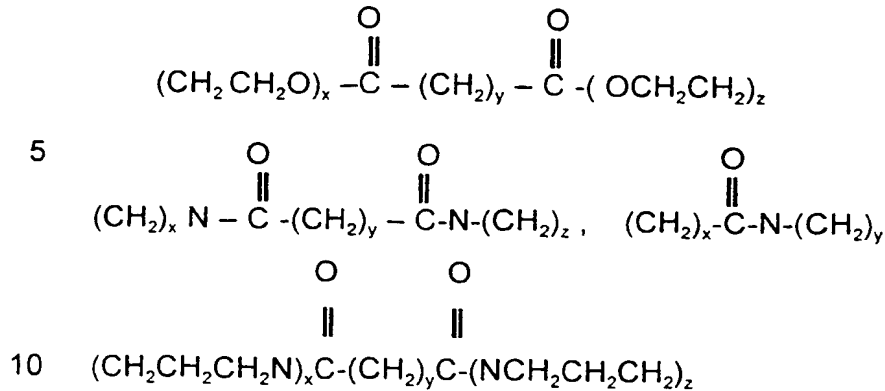
WE CLAIM:

1. A compound of general formula I, II or III:



wherein each of R_1 through R_{20} are independently selected from straight or branched chain, substituted or unsubstituted C_1 - C_{22} alkyl or alkenyl groups, wherein said alkyl or alkenyl groups optionally contain at least one ester linkage, at least one amide linkage, or mixtures thereof; A is a spacer group of the formula:





or other ester- or amide-functional alkyl group, where x, y and z are each independently selected from an integer of from 1 to 20 and wherein in each of formulae I, II and III, Z⁻ is an anion, with the proviso that R₁₅ and R₂₀ are not the same.

2. The compound of claim 1 wherein that R₁, R₂, R₇, R₁₄, R₁₅, and R₂₀ are each independently selected from the group consisting of C₁₂-C₁₈ alkyl groups, C₁₂ - C₁₈ alkyl groups containing an ester linkage and C₁₂ - C₁₈ alkyl groups containing an amide linking group.

3. The compound of claim 1 wherein each of R₁, R₂, R₃, R₄, R₅, and R₆ are selected from the group consisting of methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, C₁₃ - C₁₅ mixed alkyl group, dodecylalkyl, octadecylalkyl, oleylalkyl, cocoalkyl, soyaalkyl, tallowalkyl, hydrogenatedtallowalkyl and mixtures thereof; and n is an integer of from 1 to 5.

4. The compound of claim 1 wherein each of R₇, R₈, R₉, R₁₀, R₁₁, R₁₂, R₁₃ and R₁₄ are independently selected from the group consisting of methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, a C₁₃ - C₁₅ mixed alkyl group, dodecylalkyl, octadecylalkyl, oleylalkyl, cocoalkyl, soyaalkyl, tallowalkyl, hydrogenatedtallowalkyl and mixtures thereof; and that n is an integer of from 1 to 5.

5. The compound of claim 1 wherein each of R_{15} , R_{16} , R_{17} , R_{18} , R_{19} and R_{20} is independently selected from the group consisting of methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, a $C_{13} - C_{15}$ mixed alkyl group, dodecylalkyl, octadecylalkyl, oleylalkyl, cocoalkyl, soyaalkyl, tallowalkyl, hydrogenated tallowalkyl and mixtures thereof with the proviso that R_{15} is not the same as R_{20} ; and n is an integer of from 1-20.

6. A surfactant composition which comprises at least one of the compounds of claim 1.

7. A process for preparing the multiple functional quaternary ammonium compounds of general Formula I which comprises reacting a dialkylalkanol amine of formula



wherein each of Q_1 , Q_2 and Q_3 is independently selected from the group consisting of C_1 - C_{22} alkyl groups and a dicarboxylic acid of the formula



- wherein n is an integer of from 1-10, to form a reaction mixture and thereafter quaternizing the reaction mixture.

8. The process of claim 7 wherein said dialkylalkanol amine is prepared by ethoxylating a fatty amine compound of the formula



wherein Z is a C_{12} - C_{22} substituted or unsubstituted, saturated or unsaturated, straight or branched chain alkyl group, and Y is a C_1 - C_{22} substituted or unsubstituted, saturated or unsaturated, straight or branched chain alkyl group.

9. The process of claim 8 wherein said fatty amine compound is selected from the group consisting of dodecylamine, hexadecylamine, octadecylamine, oleylamine, cocoalkylamine, soyaalkylamine, tallowalkylamine, hydrogenatedtallowalkyl amine, dicocoalkylamine, ditallowalkylamine, dihydrogenated tallowalkylamine, dioctadecylamine, and mixtures thereof, and the quaternizing agent is a methylating agent.
10. The process of claim 7 wherein the dialkylalkanol amine is selected from the group consisting of dimethylethanolamine, diethylethanol amine, and mixtures thereof; and the dicarboxylic acid is selected from the group consisting of oxalic, malonic, succinic, glutaric, adipic, maleic, fumaric and mixtures thereof, and the quaternizing agent is a long chain alkylhalide reagent.
11. The process of claim 10 wherein the dialkylalkanolamine is dimethylethanolamine and the dicarboxylic acid is adipic acid.
12. A process for preparing multiple functional hydrophilic/hydrophobic compounds which comprises reacting a diamine of the formula:

$$Z - NH - (CH_2)_n - NH_2$$
or
a triamine or tetramine of the formula: $Z - NH - (CH_2CH_2CH_2NH)_m$
 $CH_2CH_2CH_2NH_2$ where Z is a $C_1 - C_{22}$ saturated or unsaturated alkyl group and m is 1 or 2,
with a dicarboxylic acid of the formula:

$$HOOC - (CH_2)_n - COOH$$
wherein n is an integer of from 1-10.
13. The process of claim 12 wherein Z is selected from cocoalkyl, tallow alkyl, or oleylalkyl, and the dicarboxylic acid is selected from the

group consisting of oxalic, malonic, succinic, glutaric, adipic, maleic, fumaric and mixtures thereof.

14. The process of claim 13 wherein the amine is selected from the group consisting of N-coco 1,3 – diaminopropane, N-tallow –1,3 diaminopropane, N,N,N' – trimethyl-N-tallow-1,3 diaminopropane, N-oley-1,3 diaminopropane, 3 –tallowalkyl-1,3-hexahydropyrimidine, N-tallowalkyl dipropylene triamine, N-tallowalkyl tripropylene tetramine and mixtures thereof, and the dicarboxylic acid is selected from the group consisting of oxalic, malonic, succinic, glutaric, adipic, maleic, fumaric and mixtures thereof.
15. The compound of claim 1 wherein R_{15} and R_{20} are each independently selected from the group consisting of C_{12} - C_{18} alkyl groups, methyl, ethyl, propyl, 2-ethylhexyl, nonylalkyl, and C_{13} - C_{15} mixed alkyl group, dodecylalkyl, octadecylalkyl, oleylalkyl, cocoalkyl, soyaalkyl, tallowalkyl, hydrogenatedtallowalkyl and C_{12} - C_{18} alkyl groups containing an ester or amide function ; and n is an integer of from 2 to 3.
16. The compound of claim 1 wherein R_{16} , R_{17} , R_{18} , R_{19} are independently selected from the group consisting of methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, and a C_{12} - C_{18} mixed alkyl group; and n is an integer of from 2 to 3.
17. A viscosity modifying agent comprising the compound of claim 15.
18. A viscosity modifying agent comprising the compound of claim 16.
19. The compound of claim 1 wherein R_{15} and R_{20} are each independently selected from the group consisting of C_{12} - C_{18} alkyl groups, methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, and a C_{12} - C_{18} mixed alkyl

group and C₁₂-C₁₈ alkyl groups containing an ester or amide function; and n is an integer of from 5 to 8.

20. The compound of claim 1 wherein R₁₆, R₁₇, R₁₈, R₁₉ are
5 independently selected from the group consisting of methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, and a C₁₂-C₁₈ mixed alkyl group; and n is an integer of from 5 to 8.

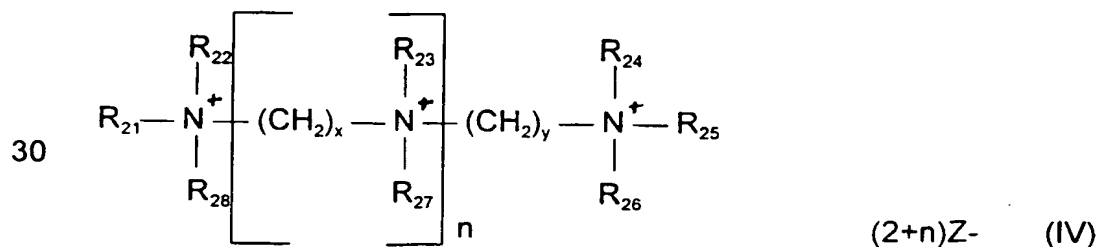
21. The compound of claim 1 wherein R₁₅ and R₂₀ are each
10 independently selected from the group consisting of C₁₂-C₁₈ alkyl groups, methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, and a C₁₂-C₁₈ mixed alkyl group and C₁₂-C₁₈ alkyl groups containing an ester or amide function, and n is an integer of from 2 to 20.

15 22. An ore flotation aid comprising the compound of claim 21.

23. The ore flotation aid of claim 22 wherein in said compound R₁₅ and R₂₀ are each independently selected from the group consisting of C₁₂-C₁₈ alkyl groups, and C₁₂-C₁₈ alkenyl groups, and C₁₂-C₁₈ alkyl groups
20 containing an ester or amide function; R₁₆, R₁₇, R₁₈, R₁₉ are methyl groups; and n is an integer of from 2 to 12.

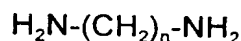
24. A calcium ore flotation aid comprising the compound of claim 23.

25 25. A process for the preparation of compounds of general formula IV



wherein R_{21} , R_{22} , R_{23} , R_{24} , R_{25} , R_{26} , R_{27} , and R_{28} are the same or different and are selected from straight or branched chain, substituted, or unsubstituted C_1 - C_{22} alkyl or alkenyl groups, wherein said alkyl or alkenyl groups optionally contain at least one ester linkage, at least one amide linkage or mixtures thereof, and where x and y are each independently an integer of from 1-20, n is 1-20 and Z^- is an anion, said process comprising the reaction of a polyaminoalkyl compound with multiple equivalents of alkyl or alkenyl aldehyde or alcohol compounds.

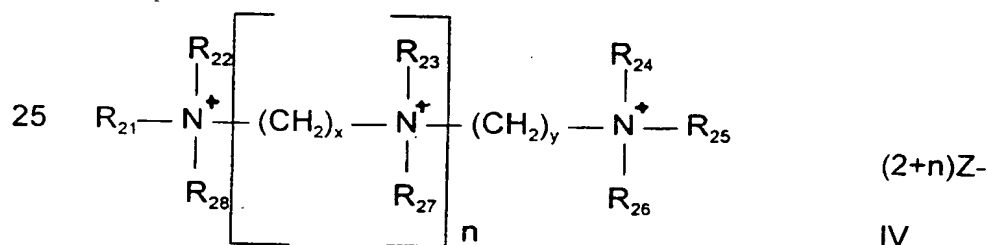
26. The process of claim 25 wherein the diaminoalkyl compound is a compound of the formula:



and the aldehyde or alcohol compound is selected from the group consisting of methyl, ethyl, propyl, 2-ethylhexyl, nonyl-alkyl, C_{12} - C_{18} mixed alkyl groups and mixtures thereof and n is an integer of from 1 to 5.

27. The process of claim 25 wherein the diaminoalkyl compound is hexamethylenediamine.

28. A compound of formula IV



wherein R_{21} , R_{22} , R_{23} , R_{24} , R_{25} , R_{26} , R_{27} , and R_{28} are the same or different and are selected from straight or branched chain, substituted, or unsubstituted C_1 - C_{22} alkyl or alkenyl groups, wherein said alkyl or alkenyl

groups optionally contain at least one ester linkage, at least one amide linkage or mixtures thereof, and where x and y are each independently an integer of from 1-20, n is greater than 1 and Z⁻ is an anion.

- 5 29. A surfactant composition which comprises at least one compound of claim 1 in combination with at least one conventional surfactant.

30. The composition of claim 29 wherein said conventional surfactant is a mono- quaternary ammonium compound.

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31. A surfactant composition which comprises at least one compound of claim 28 in combination with at least one conventional surfactant.

- 15 32. The composition of claim 31 wherein said conventional surfactant is a mono- quaternary ammonium compound.